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PATENT APPLICATION

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IN THE
UNITED STATES PATENT AND TRADEMARK OFFICE

Inventor(s): Alan R. Arthur et al.

Application No.: 10/677,024

Filing Date: September 30, 2003

Confirmation No.: 9379

Examiner: CHUO, Tony Sheng Hsiang

Group Art Unit: 1795

Title: Method of Forming an Interface Between Components Having Different Rates of Expansion

Mail Stop Appeal Brief-Patents
Commissioner For Patents
PO Box 1450
Alexandria, VA 22313-1450

TRANSMITTAL OF APPEAL BRIEF

Transmitted herewith is the Appeal Brief in this application with respect to the Notice of Appeal filed on December 26, 2007.

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☐ No Additional Fee Required.

(complete (a) or (b) as applicable)

The proceedings herein are for a patent application and the provisions of 37 CFR 1.136(a) apply.

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☒ (b) Applicant believes that no extension of time is required. However, this conditional petition is being made to provide for the possibility that applicant has inadvertently overlooked the need for a petition and fee for extension of time.

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Respectfully submitted,
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Rev 10/07(AplBrief)

Application No.: 10/677,024 Attorney Docket No.: 200311580-1

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1. Transmittal of Appeal Brief with Duplicate Copy (2 pages)
2. Certificate of Transmission (1 page)
3. Appeal Brief (20 pages)

200311580-1

10/677,024

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In the Patent Application of

Alan R. Arthur et al.

Application No. 10/677,024

Filed: September 30, 2003

For: Method of Forming an Interface Between Components Having Different Rates of Expansion

Group Art Unit: 1745

Examiner: Chuo, Tony Sheng Hsiang

APPEAL BRIEF

Mail Stop Appeal Brief - Patents
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

This is an Appeal Brief under Rule 41.37 appealing the decision of the Primary Examiner dated October 30, 2007 (the "final Office Action"). Each of the topics required by Rule 41.37 is presented herewith and is labeled appropriately.

I. Real Party in Interest

The real party in interest is Hewlett-Packard Development Company, LP, a limited partnership established under the laws of the State of Texas and having a principal place of business at 20555 S.H. 249 Houston, TX 77070, U.S.A. (hereinafter "HPDC"). HPDC is a Texas limited partnership and is a wholly-owned affiliate of Hewlett-Packard Company, a Delaware Corporation, headquartered in Palo Alto, CA. The general or managing partner of HPDC is HPQ Holdings, LLC.

II. Related Appeals and Interferences

There are no appeals or interferences related to the present application of which the Appellant is aware.

III. Status of Claims

Under a previous Restriction Requirement, claims 32-47 were withdrawn from consideration and cancelled without prejudice or disclaimer.

In the final Office Action, claims 12-31 were allowed and are, therefore, not at issue in this appeal. Consequently, the Appendix does not include claims 12-31. The Examiner further indicated the presence of allowable subject matter in dependent claims 2-8.

Only claims 1 and 9-11 were finally rejected in the final Office Action. Accordingly, Appellant appeals from the final rejection of claims 1 and 9-11, which claims are presented in the Appendix.

IV. Status of Amendments

No amendments have been filed subsequent to the final Office Action of October 30, 2007, from which Appellant takes this appeal.

V. Summary of Claimed Subject Matter

Appellant's specification discloses and claims a method of forming a component interface for use between components of differential volumetric growth rates. In various embodiments, this method may include steps such as determining dimensional characteristics of a component, defining an axis of volumetric expansion, defining a center of growth, defining a sphere centered on the center of growth, projecting the component onto the sphere to define a projection line, and forming an interface where a number of planes defining the interface each include a point on the projection line, the tangent to that point on the projection line, and the center of growth. The surface tangent to each of those planes defines the surface of the desired interface.

The only independent claim at issue on this appeal, claim 1, recites:

A method of forming an interface between components having different rates of volumetric expansion (***Appellant's specification, paragraph 0014***), said method comprising forming an interface surface (110) (***Appellant's specification, paragraphs 0017 and 0032***) of said interface with respect to a center of growth (120) (***Appellant's specification, paragraph 0018***) such that slippage occurs at said interface between said components during volumetric expansion (***Appellant's specification, paragraph 0026***).

VI. Grounds of Rejection to be Reviewed on Appeal

The final Office Action raised the following grounds of rejection.

(1) Claim 1 was rejected under 35 U.S.C. § 102(e) as being anticipated by U.S. patent App. Pub. No. 2003/0063826 to Cevasco et al. ("Cevasco").

(2) Claims 1 and 9-11 were alternatively rejected as being unpatentable under 35 U.S.C. § 103(a) over the combined teachings of U.S. Patent No. 6,677,069 to Piascik et al. ("Piascik") and U.S. Patent No. 5,374,086 to Higgins ("Higgins").

According, Appellant hereby requests review of each of these grounds of rejection in the present appeal.

VII. Argument

(1) Claim 1 is patentable over Cevasco:

Claim 1 recites: "A method of forming an interface between components having different rates of volumetric expansion, said method comprising forming an interface surface of said interface with respect to a center of growth such that slippage occurs at said interface between said components during volumetric expansion." Appellant wishes to note that claim 1 recites a "method of *forming* an interface," particularly the act of creating an interface "with respect to *a center of growth* such that slippage occurs at said interface between said components during volumetric expansion." (Emphasis added).

In contrast, Cevasco fails to teach or suggest this subject matter. In the final Office Action, Cevasco is cited as teaching an interface (36) between a housing (12) and a bearing set (14). (Final Office Action, p. 2). ***However, Cevasco is entirely silent as to anything about how that interface is designed or formed.*** Appellant notes that the final Office Action fails to indicate any teachings in Cevasco that concern a method of forming an interface as recited in claim 1. For at least this reason, this rejection of claim 1 should not be sustained.

Rather than actually citing teachings that anticipate claim 1, the final Office Action merely attempts to argue that the subject matter of claim 1 is "inherent" in Cevasco. According to the final Office Action, "[i]t is inherent that the method of forming the bearing assembly comprises a step of forming an interface surface of the interface with respect to a center of growth. Since the bearing set is a symmetrical component that includes interfaces that are partly spherical, the center of growth is a known variable that would be required to form the interface." (final Office Action, p. 3). Appellant respectfully submits that this conclusion is entirely unsupported by any evidence on the record and is clearly incorrect.

The simplistic analysis of the final Office Action appears to equate the claimed "center of growth" with the center of a single symmetrical component, such as a spherical bearing. (final Office Action, p. 5). In fact, the Action states that "the center of growth is the center of the sphere," referring to the shape of the bearing. (*Id.*). This completely ignores what is being claimed.

Appellant's specification defines "center of growth" as a specific term of art. According to Appellant's specification, "the center of growth (130) is the intersection of the lines drawn along interfaces between the components." (Appellant's specification, paragraph 0026). "The center of growth is a point at which two or more planes containing a portion of an interface or interfaces between two components intersect." (Appellant's specification, paragraph 0015). "The center of growth (120) is also a point that will be at the intersection of two or more planes which each include a portion of one or more interface surfaces between components." (Appellant's specification, paragraph 0020). Thus, the claimed center of growth is not merely defined by the geometric center of a single, spherical bearing.

Where the Appellant's specification has provided an explicit definition for a claim term, that definition must be used when construing and examining the claims. *Markman v. Westview Instruments*, 116 S. Ct. 1384 (1996); *McGill, Inc. v. John Zink Co.*, 736 F.2d 666, 674 (Fed. Cir. 1984); *ZMI Corp. v. Cardiac Resuscitator Corp.* 884 F.2d 1576, 1580, 6 U.S.P.Q.2d 1557, 1560-61 (Fed. Cir. 1988) ("words must be used in the same way in both the claims and the specification."); see also, *Lear Siegler, Inc. v. Aeroquip Corp.*, 733 F.2d 881, 888-89, 221 U.S.P.Q. 1025 (Fed. Cir. 1984); *Envirotech Corp. v. Al George, Inc.*, 730 F.2d 753, 759, 221 U.S.P.Q. 473 (Fed. Cir. 1984).

When Appellant's claims are properly understood, it is clear that the final Office Action has failed to identify any prior art teachings that anticipate a "center of growth" as

disclosed and claimed by the Appellant. As noted above, claim 1 specifically recites "[a] method of forming an interface between components having different rates of volumetric expansion, said method comprising *forming an interface surface of said interface with respect to a center of growth* such that slippage occurs at said interface between said components during volumetric expansion." (Emphasis added). This necessarily implies that the "center of growth," as defined by the Appellant, has been identified prior to forming the interface surface such that the interface surface can be formed "with respect" to that center of growth. Thus, it is irrelevant whether one could, after the fact, identify a "center of growth" for Cevasco's interface (36). The question is whether Cevasco teaches the identification of a center of growth, as defined and claimed by the Appellant, prior to, and as part of, "forming an interface surface of said interface with respect to a center of growth such that slippage occurs at said interface between said components during volumetric expansion."

Because the cited prior art does not even teach or suggest the claimed concept of a "center of growth," it is unreasonable to suggest, as does the final Office Action, that the prior art inherently teaches a method of "forming an interface surface of said interface with respect to a center of growth such that slippage occurs at said interface between said components during volumetric expansion." There is absolutely no reasonable basis on the record to reach this conclusion as does the final Office Action.

"To establish inherency, the extrinsic evidence 'must make clear that the missing descriptive matter is necessarily present in the thing described in the reference, and that it would be so recognized by persons of ordinary skill.' 'Inherency, however, may not be established by probabilities or possibilities. The mere fact that a certain thing may result from a given set of circumstances is not sufficient.'" *In re Robertson*, 49 USPQ2d 1949, 1950 (Fed. Cir. 1999) (citations omitted). "[T]he examiner must provide a basis in fact and/or

technical reasoning to reasonably support the determination that the allegedly inherent characteristic *necessarily* flows from the teachings of the applied prior art." *Ex parte Levy*, 17 USPQ2d 1461, 1464 (BPAI 1990) (emphasis in original); see also, MPEP § 2112 (quoting Levy).

Clearly, the final Office Action does not even approach this standard for establishing the claimed ***method*** is *inherent* in teachings of Cevasco. For at least this additional reason, this rejection of claim 1 should not be sustained.

"A claim is anticipated [under 35 U.S.C. § 102] only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference." *Verdegaal Bros. v. Union Oil Co. of California*, 2 U.S.P.Q.2d 1051, 1053 (Fed. Cir. 1987). See M.P.E.P. § 2131. In the present instance, the only relevance Cevasco has to claim 1 is that Cevasco mentions an interface. Cevasco clearly does not, explicitly or inherently, teach or suggest the claimed method including "*forming an interface surface of said interface with respect to a center of growth*." For at least these reasons, the rejection based on Cevasco of claim 1 and its dependent claims should not be sustained.

(2) Claims 1 and 9-11 are patentable over Piascik and Higgins:

As noted above, independent claim 1 recites a method of forming an interface. In contrast, the cited prior art is devoid of any teachings that bear specifically on a method of forming an interface as opposed to merely showing components that are already interfaced without describing the method of the interface design or formation.

As cited in the final Office Action, Piascik teaches "a radial solid oxide fuel cell stack ... comprising components that have different rates of volumetric expansion." (final Office Action, p. 3). However, Piascik does not teach or suggest anything about a *method* of

forming an interface. In fact, it is unclear why Piascik has been cited. The final Office Action does not appear to rely on Piascik for any particular teaching or suggestion. The final Office does concede, however, that "Piascik does not expressly teach a method of forming an interface comprising a step of forming an interface surface with respect to a center of growth." (Final Office Action, p. 4).

Consequently, the Action cites Higgins. (*Id.*). The Action argues that Higgins "discloses forming an interface surface on spherical housing '32' such that slippage occurs at the interface between the spherical housing and the semispherical flange '26' during thermal expansion (See column 2, lines 35-42). It is inherent that the center of growth, which is the center of the spherical component, is necessarily determined in order to form the interface." (final Office Action, p. 4).

Initially, Appellant notes that col. 2, lines 35-42 of Higgins does not include any teachings or suggestions about a *method* of forming an interface, as incorrectly implied by the final Office Action. Rather, this portion of Higgins merely mentions that, "[i]n response to vibrations and thermal expansion, the spherical housing 32 is free to articulate within the semispherical flange 26." (Higgins, col. 2, lines 39-42).

Thus, as above with Cevasco, the cited prior art does not actually teach an explicit method of forming an interface. Therefore, the position of the final Office Action boils down merely to the unsupported conclusion that "[i]t is inherent that the center of growth, which is the center of the spherical component, is necessarily determined in order to form the interface." (final Office Action, p. 4).

As noted above, the claimed "center of growth" is not merely the center of a spherical component. The final Office Action appears to be confused on this point. Appellant does describe that, in some embodiments, the method of identifying the center of growth may

include a hypothetical "sizing sphere" (130). (Appellant's specification, paragraph 0019). However, this sizing sphere is a theoretical construct, *not* a component being interfaced. Consequently, as demonstrated herein, the claimed "center of growth" is not defined merely as the center of a spherical component being interfaced, as the Office Action has incorrectly concluded.

When the "center of growth" is properly construed as disclosed and claimed by the Appellant, there is absolutely no support on the record for the Action's unreasonable conclusion that "[i]t is inherent [in Higgins] that the center of growth, which is the center of the spherical component, is necessarily determined in order to form the interface." (final Office Action, p. 4). Higgins does not inherently teach identifying a center of growth which is an "intersection of two or more planes which each includes a portion of one or more interface surfaces between components." ("Appellant's specification, paragraph 0020).

Under the analysis required by *Graham v. John Deere*, 383 U.S. 1 (1966) to support a rejection under § 103, the scope and content of the prior art must first be determined, followed by an assessment of the differences between the prior art and the claim at issue in view of the ordinary skill in the art. In the present case, the scope and content of the prior art, as evidenced by Piascik and Higgins, did not include the method recited in claim. The subject matter disclosed and claimed by Appellant appears to be entirely beyond the scope of the cited prior art.

These difference between the cited prior art and the claimed subject matter are significant because Appellant's claims provide a method of making an interface for a thermally cycled component assembly that minimizes or eliminates stress due to differential expansion rates of the components interfaced. (Appellant's specification, paragraph 0017).

These advantages provided by Appellant's methods do not appear to have been available in the prior art.

Consequently, Piascik and Higgins cannot support a rejection of any of Appellant's claims under § 103(a) and *Graham*. Therefore, the rejection based on Piascik and Higgins should not be sustained.

In view of the foregoing, it is submitted that the final rejection of the pending claims is improper and should not be sustained. Therefore, a reversal of the Rejection of October 30, 2007 is respectfully requested.

Respectfully submitted,

DATE: February 18, 2008

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Rebecca R. Schow

VIII. CLAIMS APPENDIX

1. (original) A method of forming an interface between components having different rates of volumetric expansion, said method comprising forming an interface surface of said interface with respect to a center of growth such that slippage occurs at said interface between said components during volumetric expansion.

2. (original) The method of claim 1, further comprising:

defining an axis of volumetric expansion for a first component;

projecting a sphere with a center on said axis; and

defining the center of said sphere as said center of growth.

3. (original) The method of claim 2, further comprising:

projecting a perimeter of said first component onto said sphere to define a projection line; and

forming said interface surface based on a plurality of planes each of which includes said center of growth, a point on said projection line and a tangent to that point on said projection line.

4. (original) The method of claim 3, wherein said forming said interface surface further comprises forming said interface surface tangent to all of said planes in said plurality of planes.

5. (original) The method of claim 3, further comprising

defining a second axis of volumetric expansion for a second component;

projecting a sphere with a center on said second axis; and

defining the center of said sphere as said center of growth.

projecting a perimeter of said second component onto said sphere to define a second projection line; and

forming a second interface surface in said assembly based on a plurality of planes each of which includes said center of growth, a point on said second projection line, and a tangent to that point on said second projection line.

6. (original) The method of claim 5, wherein said forming said interface surface further comprises forming said interface surface tangent to all of said planes in said plurality of planes.

7. (original) The method of claim 3, further comprising forming a second component having a complimentary interface surface that is configured to interface with said interface surface.

8. (original) The method of claim 7, wherein said complimentary interface surface of said second component substantially corresponds to said interface surface.

9. (original) The method of claim 1, wherein said components comprise components in a thermally cycled device.

10. (original) The method of claim 9, wherein said thermally cycled device comprises a fuel cell system.

11. (original) The method of claim 10, wherein said fuel cell system comprises a solid oxide fuel cell system.

12-31. (allowed)

32-47. (cancelled)

IX. Evidence Appendix

None

X. Related Proceedings Appendix

None

XI. Certificate of Service

None